

**In the Claims:**

Please cancel claims 1-3.

Please amend claims 4, 6 and 8-33 as set forth in the attached "Listing of Claims".

Please add new claim 34 as set forth in the "Listing of Claims".



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### LISTING OF CLAIMS

Claims 1-3 (Cancelled)

Claim 4 (Currently Amended): Process according to Claim 3, ~~characterized in that 34, wherein~~ the step is such that the following relationship is confirmed:

$$0.005 < \frac{F_{\text{SFR}} \times (\text{SFR})}{F_{\text{INIT}} \times (\text{INIT})} < 0.05$$

Claim 5 (Cancelled)

Claim 6 (Currently Amended): Process according to Claim 5, ~~characterized in that 34, wherein~~ the step is such that, per 100 mol of elastomer,  $F_{\text{INIT}} \times (\text{INIT})$  ranges from 0.1 to 2 mol.

Claim 7 (Cancelled)

Claim 8 (Currently Amended): Process according to Claim 7, ~~characterized in that 34, wherein~~ the step is such that, per 100 mol of monomer,  $F_{\text{SFR}} \times (\text{SFR})$  ranges from 0.0005 to 0.1.

Claim 9 (Currently Amended): Process according to claim 1, ~~characterized in that 34, wherein~~ the step of the process according to the invention is carried out in the presence of a solvent in a proportion of from 0 to 20% by weight of the sum of the mass of monomer and solvent.

Claim 10 (Currently Amended): Process according to Claim 9, ~~characterized in that wherein~~ the step of the process according to the invention is carried out in the presence of a solvent in a proportion of from 0 to 10% by weight of the sum of the mass of monomer and solvent.

Claim 11 (Currently Amended): Process according to Claim 10, ~~characterized in that wherein~~ the step of the process according to the invention is carried out in the absence of solvent.

Claim 12 (Currently Amended): Process according to claim 1, ~~characterized in that 34, wherein~~ the step is carried out at from 100 to 250°C.

Claim 13 (Currently Amended): Process according to Claim 12, ~~characterized in that wherein~~ the step is carried out at from 130 to 200°C.

Claim 14 (Currently Amended): Process according to claim 1, ~~characterized in that 34, wherein~~ the step is carried out with a degree of conversion of monomer of greater than 50%.

Claim 15 (Currently Amended): Process according to Claim 14, ~~characterized in that~~ wherein the step is carried out with a degree of conversion of monomer of greater than 90%.

Claim 16 (Currently Amended): Process according to claim 1, ~~characterized in that~~ 34, wherein the temperature during the step and in that the initiator are chosen such that the half-life of the initiator at the said temperature ranges from 30 seconds to 1 hour.

Claim 17 (Currently Amended): Process according to Claim 16, ~~characterized in that~~ wherein the half-life of the initiator at the chosen temperature ranges from 5 minutes to 30 minutes.

Claim 18 (Currently Amended): Process according to claim 1, ~~characterized in that~~ 34, wherein the initiator is chosen from diacyl peroxides, dialkyl peroxides and peroxyacetals.

Claim 19 (Currently Amended): Process according to claim 1, ~~characterized in that~~ 34, wherein at least one monomer is from the methacrylate family.

Claim 20 (Currently Amended): Process according to claim 1, ~~characterized in that~~ 34, wherein at least one monomer is a butyl methacrylate.

Claim 21 (Currently Amended): Process for the preparation of a block copolymer having a polydispersity of from about 1.8 to about 1.9, comprising a step according to claim + 34, leading to the formation of a first living block, followed by the formation of at least one block of a monomer which is different from the one used for the said step; the step being such that, per 100 mol of monomer, the following relationships are confirmed:

$$\frac{F_{\text{SFR}} \times (\text{SFR})}{F_{\text{INIT}} \times (\text{INIT})} < 0.1;$$

wherein  $F_{\text{SFR}} \times (\text{SFR})$  ranges from 0.0001 to 0.2 mol, and  
further wherein  $F_{\text{INIT}} \times (\text{INIT})$  ranges from 0.1 to 20 mol,

wherein:

(SFR) represents the number of moles of stable free radical in the polymerization or copolymerization medium,

$F_{\text{SFR}}$  represents the functionality of the stable free radical and is equal to 1 or 2,

(INIT) represents the number of moles of polymerization or copolymerization initiator in the polymerization or copolymerization medium, and

( $F_{\text{INIT}}$ ) represents the functionality of the initiator and is equal to 1.

Claim 22 (Currently Amended): Process for the preparation of a diblock polymer having a polydispersity of from about 1.8 to about 1.9, comprising a step according to claim + 34, leading to a first living block of a first monomer, followed by a step during which the first living block is placed in the presence of a second monomer which is polymerized, so as to form a second block attached to the first block; the step being such that, per 100 mol of monomer, the following relationships are confirmed:

$$\frac{F_{\text{SFR}} \times (\text{SFR})}{F_{\text{INIT}} \times (\text{INIT})} < 0.1;$$

wherein  $F_{\text{SFR}} \times (\text{SFR})$  ranges from 0.0001 to 0.2 mol, and  
further wherein  $F_{\text{INIT}} \times (\text{INIT})$  ranges from 0.1 to 20 mol,

wherein:

(SFR) represents the number of moles of stable free radical in the polymerization or copolymerization medium,

$F_{\text{SFR}}$  represents the functionality of the stable free radical and is equal to 1 or 2,

(INIT) represents the number of moles of polymerization or copolymerization initiator in the polymerization or copolymerization medium, and

( $F_{\text{INIT}}$ ) represents the functionality of the initiator and is equal to 1.

Claim 23 (Currently Amended): Process for the preparation of a triblock polymer having a polydispersity of from about 1.8 to about 1.9, comprising a step of polymerization of a third monomer in the presence of the diblock polymer prepared by the process of Claim 22, so as to form a third block attached to the diblock polymer; the step being such that, per 100 mol of monomer, the following relationships are confirmed:

$$\frac{F_{\text{SFR}} \times (\text{SFR})}{F_{\text{INIT}} \times (\text{INIT})} < 0.1;$$

wherein  $F_{\text{SFR}} \times (\text{SFR})$  ranges from 0.0001 to 0.2 mol, and  
further wherein  $F_{\text{INIT}} \times (\text{INIT})$  ranges from 0.1 to 20 mol,

wherein:

(SFR) represents the number of moles of stable free radical in the polymerization or copolymerization medium,

$F_{\text{SFR}}$  represents the functionality of the stable free radical and is equal to 1 or 2,

(INIT) represents the number of moles of polymerization or copolymerization initiator in the polymerization or copolymerization medium, and

(F<sub>INIT</sub>) represents the functionality of the initiator and is equal to 1.

Claim 24 (Currently Amended): Process according to claim 21, ~~characterized in that wherein~~, between the formation of two blocks, the temperature is at least equal to the lower temperature used to produce one of the two blocks.

Claim 25 (Currently Amended): Process according to claim 21, ~~characterized in that wherein~~, between the formation of two blocks, the temperature remains at least equal to 100°C.

Claim 26 (Currently Amended): Process for the preparation of a grafted polymer having a polydispersity of from about 1.8 to about 1.9, comprising a step according to claim 1 ~~to 34~~, in which step the initiator is a macroinitiator comprising a polymer in which at least one atom is capable of taking a radical form capable of initiating the polymerization of a first monomer in order to form a first living block grafted to the polymer; the step being such that, per 100 mol of monomer, the following relationships are confirmed:

$$\frac{F_{\text{SFR}} \times (\text{SFR})}{F_{\text{INIT}} \times (\text{INIT})} < 0.1;$$

wherein F<sub>SFR</sub> x (SFR) ranges from 0.0001 to 0.2 mol, and  
further wherein F<sub>INIT</sub> x (INIT) ranges from 0.1 to 20 mol,

wherein:

(SFR) represents the number of moles of stable free radical in the polymerization or copolymerization medium,

F<sub>SFR</sub> represents the functionality of the stable free radical and is equal to 1 or 2,

(INIT) represents the number of moles of polymerization or copolymerization initiator in the polymerization or copolymerization medium, and

(F<sub>INIT</sub>) represents the functionality of the initiator and is equal to 1.

Claim 27 (Currently Amended): Process for the preparation of a polymer grafted with a diblock copolymer, comprising a step of polymerization of a second monomer in the presence of the polymer grafted by the process of Claim 26, wherein said polymer grafted with said diblock copolymer has a polydispersity of from about 1.8 to about 1.9; the step being such that, per 100 mol of monomer, the following relationships are confirmed:

$$\frac{F_{SFR} \times (SFR)}{F_{INIT} \times (INIT)} < 0.1;$$

wherein F<sub>SFR</sub> x (SFR) ranges from 0.0001 to 0.2 mol, and  
further wherein F<sub>INIT</sub> x (INIT) ranges from 0.1 to 20 mol,

wherein:

(SFR) represents the number of moles of stable free radical in the polymerization or copolymerization medium,

F<sub>SFR</sub> represents the functionality of the stable free radical and is equal to 1 or 2,

(INIT) represents the number of moles of polymerization or copolymerization initiator in the polymerization or copolymerization medium, and

(F<sub>INIT</sub>) represents the functionality of the initiator and is equal to 1.



Claim 28 (Currently Amended): Process according to claim 1, ~~characterized in that 34, wherein~~ it is carried out at least partially in an extruder.

Claim 29 (Currently Amended): Process according to Claim 28, ~~characterized in that wherein~~ all of the polymerization steps are carried out in an extruder.

Claim 30 (Currently Amended): Process according to claim 22, ~~characterized in that wherein~~, between the formation of two blocks, the temperature is at least equal to the lower temperature used to produce one of the two blocks.

Claim 31 (Currently Amended): Process according to claim 23, ~~characterized in that wherein~~, between the formation of two blocks, the temperature is at least equal to the lower temperature used to produce one of the two blocks.

Claim 32 (Currently Amended): Process according to claim 22, ~~characterized in that wherein~~, between the formation of two blocks, the temperature remains at least equal to 100°C.

Claim 33 (Currently Amended): Process according to claim 23, ~~characterized in that wherein~~, between the formation of two blocks, the temperature remains at least equal to 100°C.

Claim 34 (New): Process for the preparation of a polymer or copolymer having a polydispersity of from about 1.8 to about 1.9, comprising a step of polymerization or copolymerization of at least one monomer via a radical route, in the presence of a polymerization or copolymerization initiator and of a stable free radical, the step being such that, per 100 mol of monomer, the following relationships are confirmed:

$$\frac{F_{\text{SFR}} \times (\text{SFR})}{F_{\text{INIT}} \times (\text{INIT})} < 0.1;$$

wherein  $F_{\text{SFR}} \times (\text{SFR})$  ranges from 0.0001 to 0.2 mol, and  
further wherein  $F_{\text{INIT}} \times (\text{INIT})$  ranges from 0.1 to 20 mol,

wherein:

(SFR) represents the number of moles of stable free radical in the polymerization or copolymerization medium,

$F_{\text{SFR}}$  represents the functionality of the stable free radical and is equal to 1 or 2,

(INIT) represents the number of moles of polymerization or copolymerization initiator in the polymerization or copolymerization medium, and

( $F_{\text{INIT}}$ ) represents the functionality of the initiator and is equal to 1.